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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/712,567	11/14/2000	James W. Watts III	97.012	9421

7590 06/07/2004

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EXAMINER

PHAN, THAI Q

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 06/07/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/712,567

Applicant(s)

WATTS ET AL.

Examiner

Thai Phan

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2, 3 and 4</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to patent application S/N: 09/712,567. Claims 1-31 are now pending.

Drawings

The drawings submitted on 11/14/2000 are accepted.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 03/12/2001, 06/07/2001, and 09/02/2003 are being considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Each of claims 17 and 21 recites the limitation "the physical system" in step (a).

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 1-15, 16, and 25-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Lu et al, US patent no. 6,375,489 B1.

As per claim 1, Lu anticipates a method and system for modeling a physical system by using object oriented programming techniques with feature limitations identical to the claimed invention. According to Lu, the method includes steps

Developing classes of simulation objects (Figs. 12, 24, 25, 29, col. 6, lines 25-48, col. 7, lines 24-40, col. 7, line 53 to col. 8, line 25, for example), wherein the simulation objects including cell group object (col. 8, lines 17-26), and connection group object (col. 10, line 50 to col. 11, line 4, for example), and running the program in a computer to determine property of the fluid material in the system (col. 26, line 45 to col. 27, line 33, for example).

As per claim 2, Lu anticipates the system comprises a hydrocarbon-bearing subterranean formation (col. 6, lines 23-46, for example).

As per claim 3, Lu anticipates the physical system under modeling containing fluid, the system associated with production of hydrocarbons from subterranean hydrocarbon bearing formation.

As per claims 4-7, Lu anticipates the system is represented by a single model, subgroups of object models (Figs. 5, 9 and description related to Figs. 5 and 9, col. 7, lines 24-41,).

As per claim 8, Lu anticipates an object oriented program used to model the system with feature limitations as claimed.

As per claim 9, Lu anticipates grid flexibility to extend to unstructured grid (col. 8, lines 53-64).

As per claims 10-15, Lu anticipates grid cells with structures as PEBI cells, three dimensional cells, cell with flexibility structure, and computation program to link such geometry cell model for simulation.

As per claim 16, Lu anticipates a method and system for modeling a physical system by using object oriented programming techniques with feature limitations identical to the claimed invention. According to Lu, the method includes steps

Discretizing the physical model into a plurality of volumetric cells (Figs. 12-13),
Developing classes of simulation objects (Figs. 12, 24, 25, 29, col. 6, lines 25-48, col. 7, lines 24-40, col. 7, line 53 to col. 8, line 25, for example) for transport phenomena, wherein the simulation objects including cell group object (col. 8, lines 17-26), and connection group object (col. 10, line 50 to col. 11, line 4, for example) for presenting the complex system under simulation, and running the program in a computer to simulate physical system behavior or characterizing the physical model such as fluid flow, flow dynamics inside the geoscience system (col. 26, line 45 to col. 27, line 33, for example).

As per claims 25 and 26, Lu anticipates a computer program product implemented in a computation system for performing steps in the method claims 1 and 16 above. According to Lu, the program product includes means for

Receiving and storing in a computer memory a list of objects and a multiplicity of connection groups (Figs. 5, 6, 7, 12, 22, col. 6, lines 25-48, cols. 7-11) for the geosystem model,

Using the objects for the geometric models to simulate behavior of the geosystem for physical characteristics of the system,

and running the program in a computer to determine property of the fluid material in the system (col. 26, line 45 to col. 27, line 33, for example) and generating the simulation output such as fluid flow, prediction of dynamic flow, etc.

As per claim 27, Lu anticipates the computation system including memory, RAM, ROM, disk, etc. as claimed.

As per claim 28, Lu anticipates a computation system for performing steps in the method claims 1 and 16 above. According to Lu, the simulator includes

A CPU for computing and processing steps of modeling,

User interface to control and command the modeling process above,

Means for receiving and storing in a computer memory a list of objects and a multiplicity of connection groups (Figs. 5, 6, 7, 12, 22, col. 6, lines 25-48, cols. 7-11) for the geosystem model,

Using the objects for the geometric models to simulate behavior of the geosystem for physical characteristics of the system,

and running the program in a computer to determine property of the fluid material in the system (col. 26, line 45 to col. 27, line 33, for example) and generating the simulation output such as fluid flow, prediction of dynamic flow, etc.

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As per claims 29-31, Lu anticipates object model, submodels, cell groups, and connection groups as claimed (col. 7, line 25 to col. 8, line 5, col. 9, line 63 to col. 11, line 32, for example).

Claims would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Allowable Subject Matter

Claims 17-20 and 21-24 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Independent claims 17 and 21 are directed to a method and system for simulating fluid flow in a hydrocarbon-bearing reservoir and its associated wells and facilities in a geophysical system. The claims require steps and means for "constructing a cell-group object associated with each said group of cells, said cell-group object containing information required by its associated group of cells"; "assembling sets of equations governing fluid flow and energy transport through the said connections between pairs of said cell"; "constructing a connection-group object associated with each said group of connections, said connection-group object containing information required by its associated group of connections", and " (h) simulating fluid flow and energy transport by using said cell-group objects and connection-group objects to compute properties of fluids contained in each cell and to compute flow of fluids and transport energy through connection".

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. US patent no. 6,078,869, issued to Gunasekera, Dayal, on June 2000
2. US patent no., 6,662,146 B1, issued to Watts, James, on Dec. 2003

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Thai Phan whose telephone number is 703-305-3812.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703-305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thai Phan

Thai Phan ,
May 30, 2004

AU: 2128

Patent Examiner
AU: 2128